EXHIBIT 28

IN THE UNITED STATES DISTRICT COURT
DISTRICT OF PUERTO RICO

In re: THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, as representative of THE COMMONWEALTH OF PUERTO RICO, et al. Debtors.	PROMESA TITLE III Case No. 17-BK-3283-LTS (Jointly Administered)
In re: THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, as representative of THE PUERTO RICO ELECTRIC POWER AUTHORITY, Debtor.	Case No. 17-BK-4780-LTS **This Court Filing Relates Only to PREPA and Shall be Filed Only in Case No. 17-BK-4780-LTS and Main Docket 17-BK-3283-LTS**

REBUTTAL EXPERT REPORT OF SUSAN TIERNEY, PHD
MAY 15, 2023

TABLE OF CONTENTS

I. QUALIFICATIONS

1. I am Susan Tierney. I am a Senior Advisor at Analysis Group, Inc., an economics consulting firm. I have prepared and submit this Rebuttal Expert Report pursuant to Analysis Group's retention by the Ad Hoc Group of PREPA Bondholders,[1] Syncora Guarantee, Inc., Assured Guaranty Corp., and Assured Guaranty Municipal Corp. (collectively, "Bondholders") in connection with their objections to confirmation of a plan of adjustment (the "Plan of Adjustment" or "Plan") filed by the Financial Oversight and Management Board ("FOMB" or "Oversight Board") on behalf of the Puerto Rico Electric Power Authority ("PREPA").

2. I previously submitted an opening expert report in this matter on April 28, 2023 ("Tierney Confirmation Report"),[2] in which, among other topics, I assessed certain inputs that FOMB used to support its Legacy Charge model, including: (i) the reasonableness of PREPA's forecast of its customers' demand for electricity (or "load forecast"); (ii) the reasonableness of FOMB's assertions regarding the future price elasticity of demand for electricity; and (iii) the reasonableness of FOMB's projection of PREPA's future capital costs.[3] My opening report discusses my qualifications and compensation in this matter. It also includes a copy of my curriculum vitae.

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[1] The Ad Hoc Group of PREPA Bondholders includes BlackRock Financial Management, Inc., Franklin Advisers, Inc., GoldenTree Asset Management LP, Invesco Advisers, Inc., Nuveen Asset Management, LLC, Taconic Capital Advisors L.P., and Whitebox Advisors LLC.

[2] Expert Report of Susan Tierney, PhD, April 28, 2023 (hereafter "Tierney Confirmation Report").

[3] Tierney Confirmation Report, ¶ 8.

3. In preparing this expert report, I, along with Analysis Group staff working under my direction, have reviewed various documents and data sources. I attach a list of documents and sources I have considered as **Appendix A** to this expert report.

II. ASSIGNMENT

4. I have been asked to review the April 28, 2023 expert report of Dr. Glenn R. George ("George Report") and assess his conclusions about the assumptions and inputs that the FOMB and its advisors at the Brattle Group use to derive the Legacy Charge—with my focus being on issues addressed in my Tierney Confirmation Report, including price elasticity, load forecast, and capital expenditures. I also was asked to address Dr. George's application of the "just and reasonable" ratemaking standard and to review deposition testimony by Mr. William Zarakas of the Brattle Group concerning certain assumptions in the Oversight Board's Legacy Charge model. I do not discuss in detail every point in the George Report with which I disagree (*e.g.,* points that were already discussed in the Tierney Confirmation Report).

III. SUMMARY OF OPINIONS

5. Several of the conclusions contained in the George Report are erroneous, unsupported and in some cases directly contradicted by the data and analysis contained in that report.

6. First, Dr. George's analysis of the academic literature on electricity price elasticity actually confirms that, as I conclude in my opening report, the FOMB substantially overstates the extent to which future volumetric rate increases would suppress demand. The FOMB has adopted long- and short-run price elasticity estimates for residential customers that are far more negative than the overwhelming consensus of the studies that Dr. George examines.

One of the papers the FOMB uses as the basis for its long-run elasticity estimate is an unpublished working paper that has outlier elasticity results, employs an unusual methodology, focuses on a geographic area quite different from Puerto Rico, and comes to the *opposite* conclusion from the FOMB regarding the existence of an incremental price-elasticity impact on solar adoption.

7. Second, the George Report erroneously states that PREPA has historically over-estimated future net load. In fact, as I concluded in my opening report, an apples-to-apples comparison of the correct net load metrics shows that PREPA has consistently *underestimated* net load and forecasted large declines in demand for electricity that have not materialized.

8. Third, the George Report fails to justify the FOMB's inclusion in its Legacy Charge derivation of billions of dollars in unexplained additional capital expenditures *not* included in the 2022 PREPA Fiscal Plan.[4] Neither Dr. George nor the Brattle Group team independently confirmed the reasonableness of this expanded capital reserve, which has the effect of dramatically reducing Net Revenues available to pay creditors. Both Dr. George and the Brattle Group team were simply instructed by counsel to accept the reasonableness of untested projections prepared by another consultant, McKinsey. The McKinsey projections run counter to PREPA's own forecasts of its capital needs. My review of the regression analysis underlying these capital expense projections revealed multiple flaws—it produces statistically insignificant results, is based on inappropriate geographic comparables, omits key variables, and uses obviously wrong input data. Finally, the FOMB ignores the availability of billions of dollars in post-hurricane federal funding that might offset the need for PREPA-funded capital spending.

[4] PREPA, "2022 Certified Fiscal Plan for the Puerto Rico Electric Power Authority," FOMB_PREPA 00000699 - FOMB_PREPA 00000882 (hereafter "2022 PREPA Fiscal Plan").

9. Finally, the George Report concludes without basis that the total customer rates resulting from FOMB's proposed Legacy Charge constitute "just and reasonable" rates. Leaving aside that the "just and reasonable" standard is used mainly in traditional ratemaking proceedings based on very near-term forecasts when forecasts are used at all, the Legacy Charge on its face does *not* meet the standard: A "just and reasonable" rate covers all of a utility's total revenue requirements, including paying debt used to build and operate the utility's system—something the Legacy Charge falls far short of accomplishing.

IV. DR. GEORGE'S ANALYSIS CONFIRMS THAT FOMB'S ESTIMATES OF ELECTRICITY PRICE ELASTICITY ARE SUBSTANTIALLY OVERSTATED AND UNREASONABLE

10. As explained in Section VII of my opening report, the FOMB substantially overstates the extent to which future volumetric rate increases would suppress PREPA's customers' demand—the so-called price elasticity effect—by using assumptions that are unreasonable, inconsistent with academic literature, and unsupported by PREPA's own prior load forecasts. Dr. Chakraborty explains, in her opening and rebuttal reports, that the FOMB's overstatement of the elasticity effect of rate increases in turn causes the FOMB to understate the amount of potential new revenue that is available to fund creditor recoveries.[5]

11. I disagree with Dr. George that the FOMB's price elasticity estimates "fall within a reasonable range."[6] In fact, as I show below, Dr. George's report demonstrates that the FOMB

[5] *See* Tierney Confirmation Report, Section VII; Expert Report of Maureen M. Chakraborty, PhD, April 28, 2023 (hereafter "Chakraborty Confirmation Report"), Section VI; Expert Rebuttal Report of Maureen M. Chakraborty, PhD, May 15, 2023 (hereafter "Chakraborty Confirmation Rebuttal Report"), Section III.E.

[6] Expert Report of Glenn R. George, MBA, PE, PhD, April 28, 2023 (hereafter "George Report"), Section III.A.2.a.

is using price elasticity estimates *much higher* than the reasonable range seen in academic literature.[7]

12. The FOMB estimates residential customers' long-run elasticity to be -1.7—i.e., it assumes that residential electricity demand will fall 1.7 percent for each 1 percent increase in volumetric electricity rates. As described in my opening report, that long-run elasticity is derived from two academic papers, Burke and Abayasekara (2018),[8] published in *The Energy Journal,* and Buchsbaum (2022),[9] an unpublished working paper.[10] As shown in **Figure 1**, the FOMB's elasticity estimate is more negative (i.e., produces a more negative effect in suppressing electrical demand) than the findings in nine of the ten academic studies that Dr. George reviewed.[11]

[7] George Report, Section III.A.2.a.

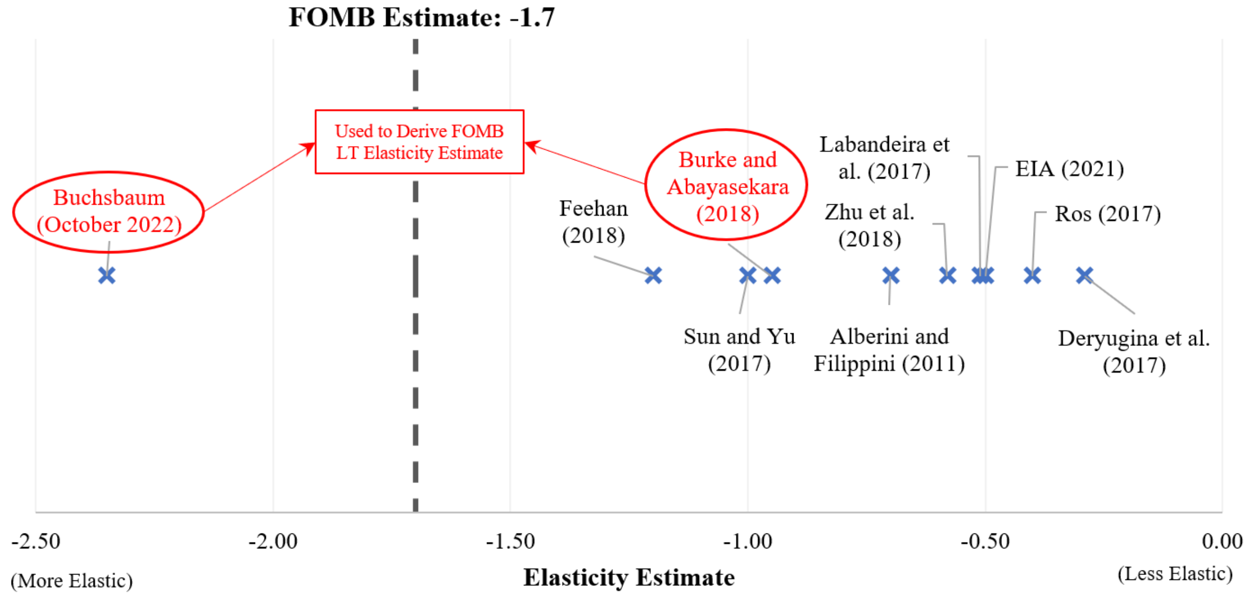
[8] Burke, Paul J. and Ashani Abayasekara, "The Price Elasticity of Electricity Demand in the United States: A Three-Dimensional Analysis," *The Energy Journal*, Vol. 39, 2018 (hereafter "Burke and Abayasekara (2018)"), FOMB_PREPA 00020208 - FOMB_PREPA 00020243, available at https://doi.org/10.5547/01956574.39.2.pbur.

[9] Buchsbaum, Jesse, "Long-Run Price Elasticities and Mechanisms: Empirical Evidence from Residential Electricity Consumers," *Energy Institute Working Paper 331*, 2022 (hereafter "Buchsbaum (2022)"), FOMB_PREPA 00022518 - FOMB_PREPA 00022589, available at https://haas.berkeley.edu/wp-content/uploads/WP331.pdf.

[10] Tierney Confirmation Report, Section VII.B.

[11] George Report, Table 2.

Figure 1: Long-Run Price Elasticity Estimates for Residential Customers Identified in the George Report Table 2



Source:
[1] George Report, Table 2.

13. As **Figure 1** shows, the unpublished Buchsbaum (2022) working paper used as part of the FOMB's long-term elasticity derivation presented an elasticity estimate much more negative than the overwhelming consensus in the literature Dr. George surveyed. He does not explain in his conclusion that it is "reasonable" (and potentially even "conservative")[12] for the FOMB to have skewed its long-run price elasticity estimates based on one outlier result, rather than adopting an estimate within the lower range of similar estimates found in all of the other relevant literature that Dr. George reviewed.

14. Dr. George evidently adopts the decision made by the FOMB and the Brattle Group team to focus on just two of these sources: the Buchsbaum (2022) working paper and the Burke and Abayasekara (2018) study. Dr. George asserts that these two papers "are particularly

[12] George Report, ¶ 52.

relevant because they are more recent and cover geographic regions similar to PREPA."[13] But, as explained in my opening report, neither of these studies supports the elasticity estimates for PREPA customers that are used in the FOMB's Legacy Charge Derivation.[14]

15. First, Buchsbaum (2022) does *not* study a "geographic region similar to PREPA"; that study focuses entirely on Pacific Gas & Electric ("PG&E") customers in central and northern California. The PG&E service territory includes diverse areas with climates classified as Mediterranean, arid steppe, and cool highland,[15] while the PREPA service territory has a tropical climate.[16] Buchsbaum emphasized that his elasticity findings were "specific to the geography and climate in this northern and central California sample."[17] Dr. George does not explain why he believes that northern and central California's geography and climate mirror Puerto Rico's; clearly they do not.

16. Nor does Dr. George address the fact that the Buchsbaum (2022) price elasticity estimate is an outlier value that appears in an unpublished working paper employing unusual statistical methodologies—in Buchsbaum's own words, "leverag[ing] a *novel* source of cross-sectional price variation."[18]

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[13] George Report, ¶ 48.

[14] Tierney Confirmation Report, ¶¶ 87-92.

[15] PG&E, "Electric Service Area Maps," November 17, 2014, available at https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_MAPS_Service%20Area%20Map.pdf; California Department of Fish and Game, "Climate and Topography," *Atlas of the Biodiversity of California*, 2nd ed., 2021, available at https://wildlife.ca.gov/Data/Atlas.

[16] World Bank, "Puerto Rico -Summary | Climate Change Knowledge Portal," available at https://climateknowledgeportal.worldbank.org/country/puerto-rico.

[17] Buchsbaum (2022), pp. 4-5.

[18] Buchsbaum (2022), p. 43 (emphasis added).

17. Dr. George further notes that "Buchsbaum finds that, in the LR [long-run], low-income customers are in fact *more* responsive to changes in price than are high income customers,"[19] But Dr. George does not address that this finding is inconsistent with conclusions in multiple studies Dr. George also reviewed, each of which found that higher-income customers, who have more alternatives available to them, have more elastic demand.[20]

18. Dr. George fails to support or explain the FOMB's derivation of a substantial "Incremental Solar PV Effect" on residential elasticity of demand, which FOMB and the Brattle Group team says it relied upon Buchsbaum (2022) to justify and produce.[21] The FOMB asserts that -0.7 of its overall -1.7 elasticity estimate for residential customers results from that "Incremental Solar PV Effect."[22] As I observe in my opening report, however, Buchsbaum himself stated that his results "effectively *rule out* solar and energy efficiency programs as mechanisms driving the observed long-run elasticities."[23]

19. I have since reviewed Mr. Zarakas's testimony, in which he explained that his Brattle Group team's introduction of an "Incremental Solar PV Effect" in the Legacy Charge model was actually meant to reflect any increased elasticity from *all sources* (not just from solar

[19] George Report, ¶ 48.

[20] Yanming Sun and Yihua Yu, "Revisiting the Residential Electricity Demand in the United States: A Dynamic Partial Adjustment Modelling Approach," *The Social Science Journal,* Vol. 54(3), 2017, pp. 295-304, available at https://doi.org/10.1016/j.soscij.2017.02.004, p. 302 ("[S]tates of relatively higher income levels are more price elastic than states of relatively lower income levels."); Schulte, Isabella and Peter Heindl, "Price and Income Elasticities of Residential Energy Demand in Germany," *Energy Policy*, Vol. 102, 2017, available at http://dx.doi.org/10.1016/j.enpol.2016.12.055, p. 512 ("[T]he behavioural response to energy price changes is weaker (stronger) for low-income (top-income) households."); Deryugina, Tatyana, Alexander MacKay, and Julian Reif, "The Long(er) Elasticity of Demand: Evidence from Municipal Electric Aggregation," Working Paper, 2017, available at https://www.haas.berkeley.edu/wp-content/uploads/T.-Deryugina.pdf, Figure 10.

[21] "LT Elasticity workbook.xlsx," FOMB_PREPA 00022590.

[22] "LT Elasticity workbook.xlsx," FOMB_PREPA 00022590.

[23] Buchsbaum (2022), p. 36 (emphasis added).

PV panels)[24] between a "baseline" time period studied by Burke and Abayasekara (2018) (from 2003 to 2015) and an updated time period studied in Buchsbaum (2022) (from 2008 to 2020).[25] Mr. Zarakas acknowledged that the time periods of the two studies substantially overlap and that both studies considered periods during which solar PV panels were available substitutes for price-sensitive consumers.[26] Neither Mr. Zarakas nor Dr. George provide any basis on which to conclude that there was a *70%* increase in residential price elasticity (from -1.0 to -1.7)[27] between the time periods studied in those papers, or that a substantial shift in consumer behavior (instead of a different studied geography and population group) is what explains Buchsbaum (2022)'s outlier result.

20. Dr. George similarly fails to support the reasonableness of the FOMB's reliance on Burke and Abayasekara (2018)'s price-elasticity assumptions. That report actually found a long-run residential elasticity figure of -1.0, which the authors themselves acknowledged was

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[24] Deposition of William Zarakas, In re: *The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority*, Debtor, No. 17-BK-4780-LTS, United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, May 4, 2023 (hereafter "Zarakas Deposition"), pp. 172:21-173:14 (Q: And so is the incremental solar PV effect intended to show an additional elasticity effect relating to rooftop solar adoption that is determined by Buchsbaum, but not determined by Burke? A: In part, correct. I'd say it's intended to reflect PV, as well as other substitutes. Q: What other substitutes? A: Could be batteries. It could be different applications used for efficiencies. Q: When it says "including PV" here, it doesn't mention those other substitutes. That's because it was Brattle shorthand? A: Yes.")

[25] Zarakas Deposition, p. 171:20-25 ("Q: […] [W]hat is the difference between the incremental solar PV effect of negative 1.4 on the one hand and the Burke and Buchsbaum values we just discussed? A: The difference is just the timing. Both include long-term prices elasticities from a variety of sources, including PV. The Burke paper was based on data through roughly 2015. So that negative 1 was kind of pre-widespread adoption and availability of substitutes, although the sub-substitutes are present there. And the later study has wider – more recent data and more, which reflects more wider availability of substitutes.")

[26] Zarakas Deposition, p. 172:17-20 ("Q: Are you aware that the years of the Burke dataset and the years of the Buchsbaum dataset overlap? A: Yes. I'm aware of that."); p. 161:2-7 ("Q: Do you have an understanding as to whether the study performed by Burke and his coauthor excluded any effects on price elasticity from the availability of rooftop solar panels? A: It did not exclude the impact of price of PV on elasticity.")

[27] Dr. George presents the long-term elasticity estimate of Burke and Abayasekara as -0.95, but the Brattle Group reports it as -1.0. "LT Elasticity workbook.xlsx," FOMB_PREPA 00022590.

already "reasonably high" in the range of academic findings on the subject, yet is still well below the -1.7 elasticity estimate that the FOMB ultimately adopted.[28]

21. I also disagree with Dr. George's attempt to distinguish two "meta-analyses," Labandeira et al. (2017)[29] and Zhu et al. (2018),[30] that I addressed in my opening report. These two studies each analyzed about 200 elasticity estimates in other studies and found that the mean long-term elasticity estimates in those studies is a fraction of those used by FOMB.[31] In particular, Dr. George asserts that these meta-analyses "may be less relevant" because they are (marginally) older than some of the others, and because studies from other parts of the world "may have less suitable geographies" than Puerto Rico does for the adoption of distributed generation alternatives.[32] But both points ignore the realities of Puerto Rico: As I noted in the Tierney Confirmation Report, the substantial up-front installed costs for rooftop solar systems (which Dr. George acknowledges),[33] and other logistical and legal hurdles (such as the number of renters who lack ownership or control of their rooftops) are barriers to the widespread adoption of distributed solar generation in Puerto Rico.[34] The studies in both meta-analyses cover a broad range of geographies, including regions that are more similar to Puerto Rico than

[28] Burke and Abayasekara (2018), p. 124.

[29] Labandeira, Xavier, José M. Labeaga, and Xiral López-Otero, "A Meta-Analysis on the Price Elasticity of Energy Demand," *Energy Policy*, Vol. 102, March 2017 (hereafter "Labandeira et al. (2017)"), available at https://www.sciencedirect.com/science/article/abs/pii/S0301421517300022.

[30] Zhu, Xing, Lanlan Li, Kaile Zhou, Xiaoling Zhang, and Shanlin Yang, "A Meta-Analysis on the Price Elasticity and Income Elasticity of Residential Electricity Demand," *Journal of Cleaner Production*, Vol. 201, November 10, 2018, available at https://www.sciencedirect.com/science/article/abs/pii/S0959652618323588.

[31] Tierney Confirmation Report, Section VII.B.3.

[32] George Report, ¶ 47.

[33] Dr. George agrees that distributed solar costs would be challenging: "[E]ven though rooftop solar has become more affordable over time, I note that customers must have the credit or disposable income necessary to participate in distributed generation and energy efficiency measures, which some of PREPA's customers cannot afford." George Report, ¶ 47.

[34] Tierney Confirmation Report, ¶ 57.

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Exhibit AHG Ex 28 2023-05-15 Rebuttal Expert Report of Sotiris (Dkt 3569-2) Page 13 of 33

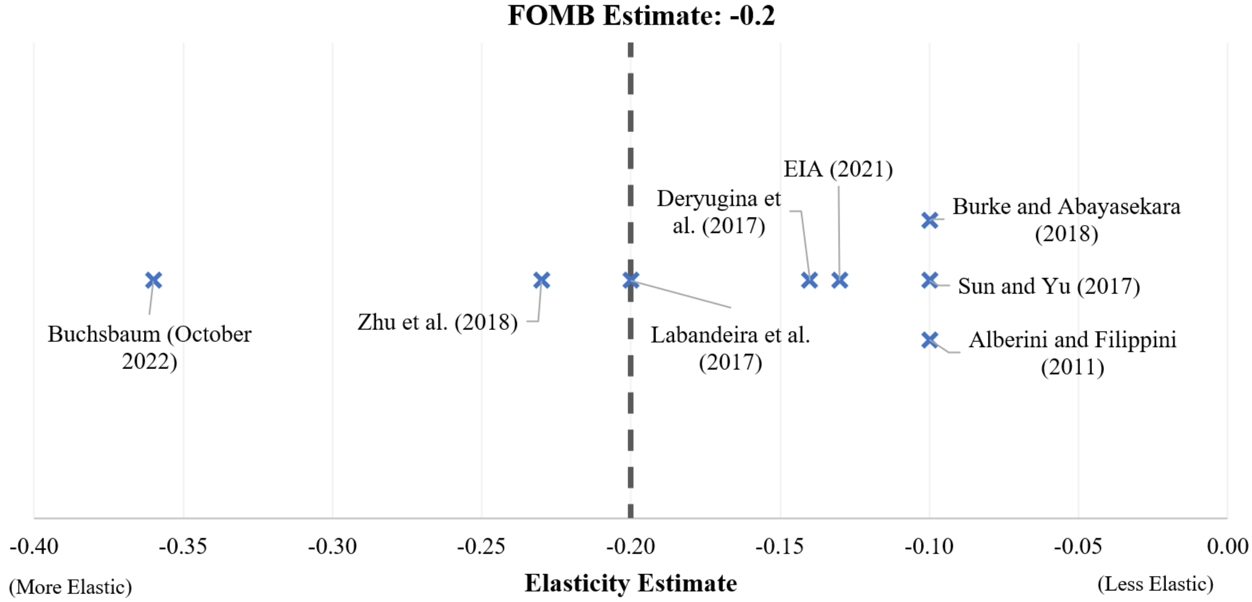
the mainland U.S.[35] These meta-analyses—which aggregate hundreds of studies and show average long-run elasticities in the middle of the range established by the other studies Dr. George considered—remain the most reliable reference point for projecting elasticity in Puerto Rico. Dr. George offers no reason to alter my conclusion that the long-run elasticity estimates relied upon by the FOMB are extremely and unreasonably high.

22. Dr. George's report also confirms that FOMB's estimated short-run elasticities are similarly out of line with the academic consensus. As shown in **Figure 2**, only two out of the eight estimates listed by Dr. George (including, again, the Buchsbaum (2022) working paper) were more negative than the -0.2 estimate used by FOMB.[36]

[35] For example, the Labandeira et al. (2017) meta-analysis includes studies of elasticity of demand for Barbados and Jamaica, two Caribbean island nations in the same geographic region as Puerto Rico. Labandeira et al. (2017), pp. 561, 565, 566.

[36] George Report, Table 2.

Figure 2: Short-Run Elasticity Estimates for Residential Customers Identified in the George Report Table 2



Source:
[1] George Report, Table 2.

23. In sum, Dr. George's own review shows that the FOMB's long-run and short-run price elasticity estimates are more negative than the weight of the academic literature would support. Rather than substantiating his conclusion that FOMB's estimates are "reasonable," Dr. George's report serves only to confirm that the FOMB overestimates the extent to which demand will fall in response to future rate increases, and thus understates the amount of future revenue available to creditors.

V. DR. GEORGE IS INCORRECT IN STATING THAT PREPA HAS HISTORICALLY OVERESTIMATED CUSTOMER LOADS

24. In my opening report, I showed that PREPA substantially understated future electricity demand in the "Base Case" load forecast that the FOMB uses in its Legacy Charge

Model.[37] As explained in Dr. Chakraborty's rebuttal report, an overly pessimistic or understated load forecast will lead to a lower estimate of the amount of revenues that PREPA is capable of collecting to pay its creditors.[38]

25. Dr. George, however, says that "the primary risk [he] considered was the situation where PREPA's forecasts had *overestimated* load."[39] He asserts that PREPA's load forecasts for fiscal years 2017-2022, in the FY 2017 Fiscal Plan[40] and the 2019 Integrated Resource Plan ("IRP")[41], "on average […] *over*estimated load by about 2%."[42] Dr. George misinterprets these data in two fundamental ways: first, he misses the point that the 2019 IRP forecast was not used in the 2022 PREPA Fiscal Plan or Revenue Envelope and Legacy Charge model (and so his comments about the IRP are irrelevant here); and second, he inappropriately commingles different metrics when he compares gross load to net load. As I explain below, Dr. George's conclusion is wrong given the facts. PREPA did not overestimate loads in its Fiscal Plans during this period. As explained in my opening report, PREPA's Base Case net load forecast demonstrates a persistent downward bias, as evidenced by an unambiguous track record of net load underestimation.[43]

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[37] Tierney Confirmation Report, Section V.

[38] Chakraborty Confirmation Rebuttal Report, Section III.D

[39] George Report, ¶ 100 (emphasis added).

[40] "PREPA Fiscal Plan Financial Model (170428) DRAFT.xlsx," FOMB_PREPA 00024665 (hereafter "2017 PREPA Fiscal Plan Model"), "Inputs" tab.

[41] Siemens, "Puerto Rico Integrated Resource Plan 2018-2019," FOMB_PREPA 00024202 - FOMB_PREPA 00024531 (hereafter "2019 IRP"), Section 3-1.

[42] George Report, ¶ 101 (emphasis added).

[43] Tierney Confirmation Report, Section VI.

26. As shown in **Table 1**, in his analysis, Dr. George compares (a) a data series which combines the 2017 Fiscal Plan's forecast of PREPA's net load (the same as sales) for 2017[44] and the 2019 IRP's forecast of "Gross Generation after EE and Customer Owned Generation" for 2019 through 2022,[45] to (b) the actual historical gross load (not accounting for distributed generation) for fiscal years 2017 and 2019-2022 as reported in the 2022 PREPA Fiscal Plan.[46] There are two problems with this comparison: First, it does not focus on the relevant metric. The 2019 IRP data series analyzed by Dr. George is a different measure of demand than the net load (i.e., net of energy efficiency and distributed generation) forecast from the 2022 PREPA Fiscal Plan that the FOMB actually uses in its Revenue Envelope and Legacy Charge models to determine revenue requirements and potential Legacy Charge revenues going forward.[47] Second, the comparison is not even apples-to-apples on its own terms. Actual *gross* load is not the metric that the *net* load and gross generation forecasts Dr. George cites are trying to forecast, so is not the right metric to compare with those forecasts. Put simply, the 2019 IRP generation forecast and historical *gross* load that Dr. George cites are irrelevant to any analysis of revenue requirements or the Legacy Charge. Therefore, Dr. George's comparison is wrong and irrelevant to the "load forecast risk" that he discusses in his report.[48]

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[44] 2017 PREPA Fiscal Plan Model, "Inputs" tab.

[45] "Gross Generation after EE and Customer Owned Generation" accounts for energy efficiency, customer owned generation, technical and non-technical losses, auxiliary generation load, and PREPA own-use load. 2019 IRP, Exhibit 3-26.

[46] FY 2018 is excluded due to impacts from Hurricanes Maria and Irma. "Revenue Envelope and Legacy Charge_protected.xlsx," FOMB_PREPA 00025462 (hereafter "Revenue Envelope and Legacy Charge Model"), "Load" tab.

[47] 2022 PREPA Fiscal Plan Model; Revenue Envelope and Legacy Charge Model.

[48] George Report, ¶ 99.

27. The more relevant comparison is between: (a) the net load forecast from the 2017 Fiscal Plan for 2017 and net load forecast from the 2019 Fiscal Plan[49] for 2019 through 2022; and (b) actual historical net load (accounting for distributed generation). Such a comparison is apples to apples—the estimated versus actual values for the Fiscal Plan net load metric actually used in the FOMB's Revenue Envelope and Legacy Charge model.[50] As shown in **Table 1**, replicating Dr. George's analysis using these data series reverses his conclusion: The 2017 Fiscal Plan and 2019 IRP forecasts do not overestimate load by "about 2%"; rather, the correct, revised comparison shows that PREPA actually *under*estimated net load by an average of -5.42% from FY2017 through FY2022, and shows a persistent negative bias in each year.[51]

[49] PREPA, "2019 FOMB - Fiscal Plan for PREPA, as Certified by FOMB on June 27 2019," June 27, 2019 (hereafter "2019 PREPA Fiscal Plan"), available at https://aeepr.com/es-pr/Documents/Exhibit%201%20-%202019%20Fiscal_Plan_for_PREPA_Certified_FOMB%20on_June_27_2019.pdf.

[50] Tierney Confirmation Report, Section VI.

[51] Fiscal year 2018 is excluded from the analysis since Hurricanes Maria and Irma hit Puerto Rico during that fiscal year and caused widespread electricity market disruptions. Dr. George likewise excludes fiscal year 2018 from his analysis.

Table 1: Revised George Report Load Forecast Comparison

George Report Comparison

Fiscal Year	2017 PREPA Fiscal Plan and 2019 IRP Forecasts (GWh)[1]		Actual Gross Load Not Adjusted for Distributed Generation (GWh)[2]		% Difference (Forecast / Actual)
	Forecast (GWh)	Source	Forecast (GWh)	Source	
2017	17,051	2017 PREPA Fiscal Plan (Net Load)	17,162	2022 PREPA Fiscal Plan (Gross Load)	-0.6%
2019	18,196	2019 IRP (Gross Generation after EE and Customer Owned Generation)	16,275		11.8%
2020	17,410		16,256		7.1%
2021	16,876		16,594		1.7%
2022	16,028		17,356		-7.6%
Average	**17,112**		**16,728**		**2.46%**

Revised Comparison

Fiscal Year	2017 and 2019 PREPA Fiscal Plan Net Load Forecasts[3]		Actual Net Load Adjusted for Distributed Generation (GWh)[4]		% Difference (Forecast / Actual)
	Forecast (GWh)	Source	Forecast (GWh)	Source	
2017	17,051	2017 PREPA Fiscal Plan (Net Load)	16,996	2022 PREPA Fiscal Plan (Net Load)	0.3%
2019	15,764	2019 PREPA Fiscal Plan (Net Load)	16,050		-1.8%
2020	15,832		16,004		-1.1%
2021	14,772		16,280		-9.3%
2022	13,972		16,492		-15.3%
Average	**15,478**		**16,364**		**-5.42%**

Notes:
[1] George Report forecasts are from 2017 PREPA Fiscal Plan for net load in 2017 and the 2019 IRP, series "Gross Generation after EE and Customer Owned Generation" (Exhibit 3-26) for 2019-2022.
[2] George Report Actual Gross Load is from the 2022 PREPA Fiscal Plan Model, "Load" tab, row 14.
[3] Revised Comparison forecasts are from 2017 PREPA Fiscal Plan for 2017 and the 2019 Fiscal Plan for 2019-2022.
[4] Revised Comparison Actual Net Load is from the 2022 PREPA Fiscal Plan Model, "Load" tab, row 160.
[5] FY 2018 is excluded from the analysis since Hurricanes Maria and Irma hit Puerto Rico during that fiscal year and caused widespread electricity market disruptions. Dr. George likewise excludes FY2018 from his analysis.
Sources:
[1] 2017 PREPA Fiscal Plan Model.
[2] 2019 IRP.
[3] 2019 PREPA Fiscal Plan.
[4] 2022 PREPA Fiscal Plan Model.

28. When the correct *net* load forecasts from PREPA's 2017 and 2019 Fiscal Plans are extracted and compared to the correct historical *net* load values for fiscal years 2017-2022, it is clear that PREPA underestimated net load for fiscal years going forward. his pattern is

consistent with the analysis I conducted and explained in the Tierney Confirmation Report, Section VI, which shows that PREPA's Fiscal Plan net load forecasts have persistently estimated declines in loads that have not historically occurred.[52] Indeed, PREPA itself acknowledges the same pattern of load underestimation in its 2022 Fiscal Plan.[53]

VI. DR. GEORGE'S AND THE FOMB'S ASSESSMENT OF CAPITAL EXPENDITURES IS INAPPROPRIATE AND MISSES KEY VARIABLES

29. As explained in my opening report, PREPA's assumptions about its future capital costs are a key input into its revenue requirement and rate forecasts, because such costs affect the amount of revenue that will need to be collected from customers. In the context of this proceeding, as I have explained, PREPA's unreasonably high projections of future capital costs put downward pressure on the amount of potential revenues available to fund creditor recoveries.

30. Dr. George's report fails to justify these unreasonably high projections. He provides no basis for the FOMB's upward departure from its own certified 2022 PREPA Fiscal Plan capital cost forecasts. He admits that none of the experts seeking to justify the additional large forecast of capital costs did any independent work to confirm their reasonableness, but were simply instructed by counsel to accept the results generated by another consultant. And he therefore fails to have noticed significant errors in the consultant's underlying regression analysis that make it an unreliable basis for the FOMB's inflated capital forecast. The George Report also errs in ignoring the availability of billions of dollars in federal funding that could offset any increased capital needs, and in failing to question the need for an automatic $50 million annual

52 Tierney Confirmation Report, Section VI.

53 2022 PREPA Fiscal Plan, Exhibit 62.

reserve to cover a portion of FEMA-related projects that PREPA has elsewhere assumed would be covered by other public funding.

31. Dr. George states that an independent consultant (identified as McKinsey by Mr. Zarakas[54]) retained by the FOMB created a projection of PREPA's future transmission and distribution (or "T&D") capital expenditures (or "CapEx") based on "comparable utility companies in the southeastern US," and estimated that PREPA would have an "Expected T&D CapEx" target of $250 million per year starting in FY2023 (adjusted thereafter for inflation).[55] The Brattle Group team was then instructed to adopt that projection in determining the Legacy Charge for the fiscal years after 2034. Like the Brattle Group team, Dr. George also was "not able to independently verify this annual CapEx estimate" but nonetheless adopted it as a given when analyzing whether the Revenue Envelope Model had appropriately accounted for capital expenditures (even though those amounts exceeded the expected spending PREPA forecast in its own Fiscal Plan).[56] Without such an independent confirmation of that annual CapEx estimate, it is not clear what basis Dr. George had for concluding that PREPA will need to fund an additional $2.425 billion (in nominal terms) in capital expenses over the next three decades—over and above the capital expenses PREPA has currently forecast in its certified 2022 Fiscal Plan—except that he was instructed to do so. I did take a look at the available underlying models and documentation and have come to the opposite conclusion.

32. As an initial matter, and as I described in the Tierney Confirmation Report, the 2022 PREPA Fiscal Plan already includes PREPA-funded capital cost estimates in 2034 to 2051,

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[54] Zarakas Deposition, p. 217:8-13 ("Q: And where do these numbers come from, if you know? A: The same board advisor. Q: Did all of the numbers in this worksheet come from McKinsey? A: Yes.")

[55] George Report, ¶ 73 and footnote 89.

[56] George Report, footnote 89.

which are between \$124.5 to \$91.7 million lower than the inflated "Expected T&D CapEx" in each year.[57] The FOMB has not explained why its own forecast for capital expenditures exceeds what PREPA concluded in the 2022 PREPA Fiscal Plan was sufficient to keep PREPA a viable operating entity—or why these additional costs have become evident only at this point in time. And Dr. George likewise ignores this in adopting the capital expenditure estimate as a given.

33. That aside, I have reviewed the McKinsey regression model used by the FOMB that underlies the "Expected T&D CapEx" assumed in the Revenue Envelope and Legacy Charge Model. For a variety of reasons, I conclude this regression model is not an appropriate tool for forecasting expected capital expenditures for PREPA.[58]

34. The regression model[59] of "Expected T&D CapEx" created by McKinsey is based on 16 utilities.[60] Contrary to Dr. George's description that this is based on the "spending of comparable utilities in the southeastern US,"[61] the model goes beyond the southeastern US and includes utilities as far away as Oklahoma and Texas, without any explanation of the criteria on which the "comparable utilities" were chosen. The regression model attempts to estimate each utility's annual 2022 T&D capital expenditures based a regression of each utility's actual 2010-2019 average T&D CapEx on three explanatory variables: (1) 2019 Medium Voltage

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[57] Tierney Confirmation Report, ¶ 113.

[58] "20230512 Utility Benchmark PREPA CAPEX.xlsx" (hereafter "McKinsey CapEx Regression Model"), tabs "CAPEX Regression (1)," "CAPEX Output (1)." Access to this regression model was first provided to me by the Oversight Board's counsel on May 12, 2023, weeks after bondholders' counsel sought such access at my request. For that reason, I was not able to consider this regression model in connection with my opening report.

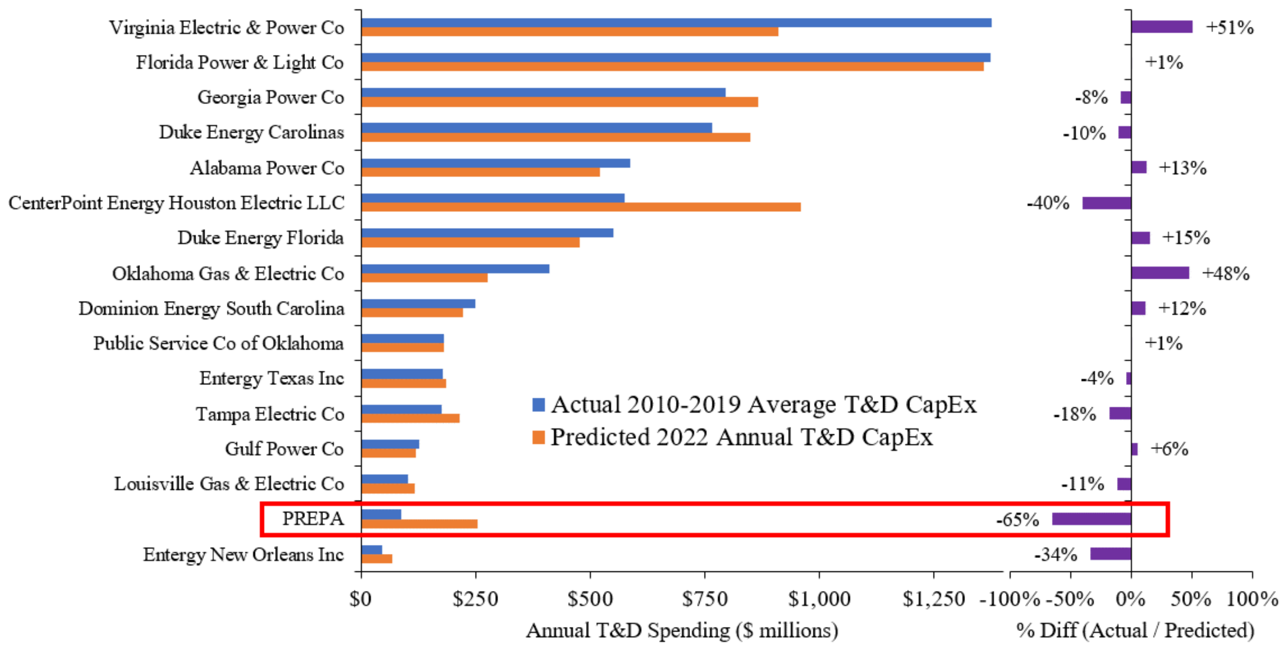
[59] Regression analysis is a statistical tool for analyzing historical data and determining the extent to which various combinations of explanatory (or "independent") variables predict values for the outcome (or "dependent") variable, in this case annual T&D CapEx spending. *See e.g.*, Carter Hill, R., W.E. Griffiths, and G. C. Lim, *Principles of Econometrics*, 4th ed., John Wiley & Sons, Inc., 2011, pp. 40, 42.

[60] McKinsey CapEx Regression Model.

[61] George Report, ¶ 73.

Transmission Network Length, (2) 2019 Number of Electric Customers, and (3) 2019 Total Electricity Delivered, but does not explain why those variables were chosen. The model forecasts a "Predicted 2022 Annual T&D CapEx" of $254 million for Puerto Rico, which is apparently then rounded to the $250 million target adopted by the FOMB. **Figure 3** shows McKinsey's CapEx regression results for PREPA and the other US utilities studied.

Figure 3: Results of McKinsey's Expected T&D CapEx Regression



Note:
[1] The data point labeled by McKinsey as "Actual 2010-2019 Average T&D CapEx" for PREPA actually appears to be the average of PREPA-funded T&D CapEx for only 2017 and 2019-2021 from the 2021 PREPA Fiscal Plan, excluding all FEMA-funded T&D CapEx.
Source:
[1] McKinsey CapEx Regression Model.
[2] "FOMB - May 2021 FP Model_Data_Room_vF2.xlsx," FOMB_PREPA 00020362.

35. McKinsey's regression model is flawed and unreliable for several reasons. First, the regression results fail to meet basic statistical tests of validity. When conducting a regression analysis, researchers aim to identify and quantify relationships between variables. The regression coefficients represent the estimated effects of the explanatory variables on the outcome

variable.[62] "Statistical significance" tests are used to assess whether these coefficients are significantly different from zero.[63] Statistical significance provides evidence that the relationship observed in the regression analysis is not likely to be a result of random variation in the data.[64] In this case, *none* of the estimated coefficients on McKinsey's explanatory variables are statistically significant at standard levels accepted in statistical research.[65] This implies that the estimated relationships between the explanatory variables in McKinsey's model and utility T&D CapEx could simply be random chance or statistical noise.

36. Second, utilities in the "southeastern US" (as defined by McKinsey) span a wide range of geographies, climates, and utility-system characteristics quite different from Puerto Rico's. A model calibrated on utilities in these locations is not useful or appropriate for predicting T&D capital spending in Puerto Rico. For example, McKinsey included in the dataset utilities in Texas and Oklahoma, even though Oklahoma and Texas have population densities, weather, and climates that are very different than Puerto Rico's.[66] It is inappropriate to compare

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[62] Wooldridge, Jeffrey M., "Introductory Econometrics: A Modern Approach," *Cengage Learning International*, 5th ed., 2012, pp. 22-24.

[63] Specifically, hypothesis tests evaluate if the effect of a given coefficient is statistically different from zero at a given level of significance. If the test fails to refute this hypothesis, then we say that the effect of that variable is statistically insignificant at that level of confidence. Wooldridge, Jeffrey M., "Introductory Econometrics: A Modern Approach," *Cengage Learning International*, 5th ed., 2012, pp. 128-129.

[64] In most scientific work, the level of statistical significance required to reject the null hypothesis is set conventionally at 5%. Rubinfeld, Daniel L., "Reference Guide on Multiple Regression," Reference Manual on Scientific Evidence, 3rd ed., National Academies, 2011, p. 431.

[65] The coefficients from McKinsey's regression model are not significant at standard 1%, 5%, or 10% levels. Rubinfeld, Daniel L., "Reference Guide on Multiple Regression," Reference Manual on Scientific Evidence, 3rd ed., National Academies, 2011, p. 431 ("In doing a statistical test, it is useful to compute an observed significance level, or p-value. The p-value associated with the null hypothesis that a regression coefficient is 0 is the probability that a coefficient of this magnitude or larger could have occurred by chance if the null hypothesis were true.")

[66] For example, the most recent 30-year historical climate normal data for the period of 1981-2010 indicated that Oklahoma City, Oklahoma observed 3,365 Normal Heating Degree Days and Houston, Texas observed 1,291, whereas San Juan, PR observed 0. For the same period, Oklahoma City, Oklahoma observed 2,099 Normal Cooling Degree Days and Houston, Texas observed 2,940, whereas San Juan, PR observed 5,855. Normal Heating Degree Days were measured between June and July of each year in the period and Normal Cooling Degree Days were measured between January and December of each year. Degree day data "estimates amounts of energy required to

PREPA-funded CapEx with the "Expected T&D CapEx" for dissimilarly situated utilities in other parts of the US.

37. Third, McKinsey's regression model omits important variables relevant to T&D capital expenditures. A reasonable measure of expected capital expenditures for a utility for financial planning purposes would need to consider factors such as geography, climate, history of capital spending, the age and character of its infrastructure, and outside sources of capital funding.[67] For example, a utility with a geographically concentrated customer base would have different capital spending requirements for its transmission system compared to a utility with customers that were highly spread out. McKinsey's regression model includes none of these variables, and McKinsey does not explain how it chose the variables it used (or excluded).

38. Fourth, the source data used for McKinsey's regression includes obvious factual errors. One of the explanatory variables used in the regression is 2019 Medium Voltage

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maintain comfortable indoor temperature levels" and "are computed from each day's mean temperature (max + min/2)" such that any day's mean temperature above or below 65 degrees Fahrenheit constitutes a heating or cooling degree day. Heating and cooling degree days are a straightforward way to compare climatic data observed at different major weather observing stations in mainland U.S., Puerto Rico, and the Pacific Island. *See* National Centers for Environmental Information, "Comparative Climatic Data (CCD)," available at https://www.ncei.noaa.gov/products/land-based-station/comparative-climatic-data.

[67] For example, a report by the U.S. EIA discussed capital investments resulting from the replacement, modernization, and expansion of the distribution systems of major U.S. utilities. Age and character of the infrastructure would impact the amount an electric utility would spend on replacing current infrastructure. *See* U.S. Energy Information Administration, "Major utilities' spending on the electric distribution system continues to increase," available at https://www.eia.gov/todayinenergy/detail.php?id=48136. Additionally, climate, especially the frequency of extreme weather disasters such as hurricanes, impacts the amounts of outside sources of capital funding available to utilities. For example, federal funding provided by the U.S. Department of Housing and Urban Development (HUD) is available to privately-owned utilities impacted by major disasters through the Community Development Block Grant Disaster Recovery (CDBG-DR) funds (provided that HUD adopts alternative requirements or approves a waiver that permits allocation of CDGB-DR funds to privately owned utilities in connection with the disaster). U.S. Department of Housing and Urban Development, "Assistance to Privately Owned Utilities and Related Waivers," available at https://files.hudexchange.info/resources/documents/CDBG-MIT-Assistance-to-Privately-Owned-Utilities-and-Related-Waivers.pdf. *See also*, *e.g.*, U.S. Department of Housing and Urban Development, "U.S. Community Development Block Grant Disaster Recovery (CDBG-DR) Private Utility Alternative Requirements Memorandum," December 7, 2022, available at https://www.hud.gov/sites/dfiles/CPD/documents/CDBG-DR/CDBG-DR-Private-Utility-Req-for-grants-Public-Law-117-43_final.pdf.

Transmission Network Length, which the McKinsey data set indicates having a value of *zero* for both Duke Energy Florida and Gulf Power. This is wrong. McKinsey does not include a definition of "Medium Voltage," but lists PREPA's Medium Voltage Transmission Network Length as 1,100 miles based on the 115 and 230 kilovolt ("kV") transmission line mileage listed in the 2022 PREPA Fiscal Plan.[68] According to Duke Energy's annual report for 2019, Duke Energy Florida owned 2,529 miles of electric transmission lines with between 100 and 230 kV voltage, voltages in the same range as that of PREPA's "Medium Voltage" transmission system.[69] Gulf Power in 2019 owned approximately 9,500 miles of transmission and distribution lines in Florida, some of which would have been classified as "Medium Voltage" under any reasonable definition of the term.[70] I have not confirmed all of McKinsey's regression input data, but such obvious data errors call into question the validity of this regression model as a whole.

39. Separately from these severe flaws in the model itself, it is unreasonable for the FOMB and the Brattle Group team simply to adopt the results of McKinsey's regression analysis as an amount of T&D capital expenditures that would be needed to be funded by PREPA ratepayers. By claiming that $2.425 billion (in nominal terms) of future additional revenue capacity needs to be reserved by PREPA for additional capital costs, the FOMB assumes that PREPA's customer-provided revenues are the only source of money for its capital spending—a result that Dr. George does not question.[71] This is not true. As I showed in the Tierney

[68] McKinsey CapEx Regression Model; 2022 PREPA Fiscal Plan, p. 27.

[69] Duke Energy Corporation 2019 Form 10-K, filed February 20, 2020, p.35, available at https://s201.q4cdn.com/583395453/files/doc_financials/2019/ar/2019-duke-energy-form-10-k.pdf.

[70] NextEra Energy, Inc. 2019 Annual Report, p. 95, available at https://www.investor.nexteraenergy.com/~/media/Files/N/NEE-IR/investor-materials/shareholder-resources/2019%20NEE%20Annual%20Report.pdf.

[71] George Report, ¶¶ 73-76.

Confirmation Report, *$14 billion* in federal funding has been committed by the Federal Energy Management Agency ("FEMA") and other federal agencies to help rebuild Puerto Rico's damaged grid following Hurricanes Maria and Irma. $8.1 billion of this federal funding is committed for T&D "Rebuild and Transformation" spending on PREPA's grid.[72] This infusion of substantial federal funding is likely to mitigate the need for customer-sourced T&D capital expenditures in the decades to come. And Dr. George also fails to explain why it is reasonable for the FOMB to further assume a $50 million annual reserve from 2024 to 2033 for PREPA's cost-share obligations on FEMA-related projects, given that PREPA itself and other Puerto Rico officials have stated that those costs would be covered by other public funding (*i.e.*, Department of Housing and Urban Development grants).[73]

40. In conclusion, significant flaws make McKinsey's regression model an inappropriate tool for forecasting expected capital expenditures in Puerto Rico. The FOMB is without any reasonable basis for its assumption (used in the Revenue Envelope Model) that PREPA will face incremental CapEx costs beyond those forecast by PREPA.[74] And Dr. George is likewise without justification when he adopts those capital expenditure estimates as a given.

VII. DR. GEORGE INCORRECTLY USES THE "JUST AND REASONABLE" STANDARD IN HIS ANALYSIS OF THE LEGACY CHARGE

41. Dr. George misleadingly argues that the Legacy Charge is consistent with the concept of "just and reasonable" rates.[75] But even putting aside that this concept is rarely, if ever,

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[72] 2022 PREPA Fiscal Plan, p. 87.

[73] *See* Tierney Confirmation Report, ¶¶ 110-111.

[74] Tierney Confirmation Report, ¶ 114.

[75] George Report, Section III.C.

applied outside the context of a utility regulatory ratemaking proceeding, the Legacy Charge design would not be considered "just and reasonable" because it violates key utility ratemaking principles—including because it fails to provide recovery of the full cost of capital.

42. "Just and reasonable" is a standard legal and regulatory concept in utility ratemaking that generally requires regulators to balance the interests of multiple stakeholders (e.g., the utility and the providers of its capital, including creditors; its customers) when designing rates.[76] As noted in the utility regulatory literature, "[t]his balancing recognizes that while utility customers should pay rates that are reasonable, the rates must be sufficient to produce a profit level that enables the utility to maintain its financial integrity and attract capital."[77] As a former utility regulator, I am familiar with how the "just and reasonable" standard is used in federal and state utility ratemaking.[78]

43. Dr. George attempts to support his conclusion that the Legacy Charge is "just and reasonable" by pointing to the widely used Bonbright principles of utility ratemaking.[79] In

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[76] Pechman, Carl, "Modernizing the Electric Distribution Utility to Support the Clean Energy Economy," paper prepared for the U.S. Department of Energy, August 25, 2016, available at https://www.energy.gov/sites/prod/files/2017/01/f34/Modernizing%20the%20Electric%20Distribution%20Utility%20to%20Support%20the%20Clean%20Energy%20Economy_0.pdf'; California Public Utilities Commission, "Utility General Rate Case – A Manual for Regulatory Analysts," November 13, 2017, available at https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/about_us/organization/divisions/policy_and_planning/ppd_work/ppd_work_products_-2014_forward-/ppd-general-rate-case-manual-1-.pdf.

[77] Van Nostrand, James M., "The Standard for Setting Utility Rates in Wyoming: Restoring the Required Balance between Investors and Customers," *Wyoming Law Review*, Vol. 4, No. 1, 2004, p.1, available at https://scholarship.law.uwyo.edu/cgi/viewcontent.cgi?article=1078&context=wlr; Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia et al., 262 U.S. 679 (1923), available at https://www.law.cornell.edu/supremecourt/text/262/679.

[78] I note that there are some utilities that are publicly owned where the relevant legislative body allows the publicly accountable board of directors of such utilities to establish the utility's rates without review and approval of public utility regulators. National Academies of Sciences, Engineering and Medicine, *The Future of Electric Power in the U.S.*, The National Academies Press, 2021, available at https://doi.org/10.17226/25968. (As a member of the NASEM Committee on the Future of Electric Power, I am a co-author of this report.)

[79] George Report, ¶ 96.

laymen's terms, these principles include economic efficiency, financial sustainability for the utility, equity, fairness, and providing rates that are simple to understand and relatively stable over time.[80] But Dr. George applies these principles selectively and inappropriately.

44. For starters, this proceeding is not a rate case, and so these principles are largely (if not entirely) inapplicable. The FOMB's attempt to develop a Legacy Charge through a roughly 35-year forecast of both demand and costs is well outside of the norm of utility ratemaking. Utility rates are customarily set based on the utility's "revenue requirement"—i.e., the revenues that will be necessary to cover the full cost of providing service to customers. When undertaking that analysis, the utility's costs are known and measurable for a historical or near-term future "rate year" using billing determinants (sales to customers) for the same rate year. I am not aware of any ratemaking case where rates were set based on a more-than-three-decade forecast of costs or revenues. Dr. George does not address this distinction.

45. In any event—and most importantly—Dr. George is wrong to conclude the Legacy Charge is "just and reasonable." Under Dr. George's own definition, one key aspect of "just and reasonable" rates is that they "allow the utility to be compensated for prudently incurred costs"[81] and "effectively yield total revenue requirements under the fair return standard" (which would include a fair return for equity investors, if any).[82] In this case, the debt service costs on legacy borrowings incurred by PREPA are part of its "total revenue requirement" that traditional ratemaking principles would not permit a utility simply to abandon—such debt was

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[80] Bonbright, James C., Principles of Public Utility Rates, Columbia University Press, 1961.

[81] PREC, a predecessor to PREB, has acknowledged similar principles. Puerto Rico Energy Commission, Resolution in Response to PREPA's May 25, 2017 Motion, *In Re: Puerto Rico Electric Power Authority Rate Review*, No. CEPR-AP-2015-0001, May 26, 2017 available at https://energia.pr.gov/wp-content/uploads/sites/7/2017/05/Resolution-PREPAs-Motion-May-25-CEPR-AP-2015-0001.pdf.

[82] George Report, ¶¶ 93, 96.

Case:17-03283-LTS Doc#:24589-28 Filed:06/12/23 Entered:06/12/23 21:06:46 Desc:
Exhibit AHG Ex. 28 2023-05-15 Rebuttal Expert Report of S. Tierney (Dkt 3569-2) Page 29 of 33

used to fund PREPA's past operations and capital improvements. If PREPA charges rates that are known to be insufficient to produce revenue to pay its legacy debt, then that necessarily violates multiple Bonbright principles, including: (1) "revenue sufficiency" and (2) "efficiency" (i.e., charging customers a rate that signals the cost to provide them with utility service).[83] Accordingly, the Legacy Charge is not, contrary to Dr. George, "just and reasonable."[84]

Signed on the 15th day of May, 2023.

Susan Tierney

[83] National Association of Regulatory Utility Commissioners, "Primer on rate design for cost-reflective tariffs," January 2021, available at https://pubs.naruc.org/pub.cfm?id=7BFEF211-155D-0A36-31AA-F629ECB940DC. Bonbright, James C., Principles of Public Utility Rates, Columbia University Press, 1961.

[84] I acknowledge that, in a PROMESA proceeding, PREPA may be legally authorized to restructure its legacy debts (including, potentially, by reducing their amount). I am not offering any legal opinion on whether and in what circumstances such restructuring is permitted in a Title III proceeding. My point is simply that Dr. George selectively applies the "just and reasonable" ratemaking principle to a Legacy Charge that, by definition, violates that principle because it does not start—as traditional ratemaking does—from the premise that revenues must be generated from customers in total amounts sufficient to pay all prudent costs of the utility.

APPENDIX A
Materials Considered

<u>Legal Documents</u>

Deposition of William Zarakas, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, No. 17-BK-4780-LTS, United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, May 4, 2023.

<u>Expert Reports</u>

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Expert Report of Maureen M. Chakraborty, PhD, April 28, 2023.

Expert Report of Susan Tierney, PhD, April 28, 2023.

Expert Rebuttal Report of Maureen M. Chakraborty, PhD, May 15, 2023.

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